Assignment 1

Textbook Assignment: “Utility Systems.” Pages 1-1 through 1-23.

Learning Objective: *Recognize the operating principles and functions of auxiliary bleed-air utility Systems.*

1-1. In addition to furnishing air for air-conditioning and pressurization system, auxiliary bleed air also supplies air for which of the following actions or systems?

1. Electronic equipment cooling
2. Windshield washing, anti-icing
3. Anti-g system
4. Each of the above

1-2. Auxiliary system bleed air can range up to what maximum temperature and pressure?

1. 100°F and 50 psi
2. 200°F and 90 psi
3. 400°F and 125 psi
4. 600°F and 150 psi

1-3. The windshield anti-ice/rain removal system is designed to provide a means of maintaining visibility from the aircraft.

1. True
2. False

1-4. What are the three modes of operation controlled by the windshield anti-ice/rain removal switch?

1. Normal, rain, anti-ice
2. Off, rain, anti-ice
3. On, anti-ice, rai n
4. Off, on, automatic

1-5. The supply air temperature is controlled to a lower limit of 290°F by which of the following?

1. Cooling as it passes through the ducting
2. Warm air temperature control valve
3. Warm air temperature sensor
4. Both 2 and 3 above

1-6. The warm air overtemperature sensor actuates when supply air temperature reaches which of the following ranges?

1. 275° ± 50°F
2. 300° ± 50°F
3. 375° ± 25°F
4. 400° ± 75° F

1-7. The anti-ice/rain removal air control regulating valve completes the final pressure regulation and flow control before airflow reaches what item?

1. The anti-ice/rain removal nozzle
2. The anti-ice modulating valve
3. The windshield
4. The air temperature control valve

1-8. The windshield overheat temperature sensor closes when airflow temperature drops to what minimum level?

1. 290° ± 5°F
2. 300° ± 10°F
3. 280° ± 5°F
4. 250° ± 25°F

1-9. Anti-g systems are used to prevent which of the following effects on the pilot?

1. Excessive fatigue
2. Decreased alertness
3. Both 1 and 2 above
4. Air sickness

1-10. What is the source of air pressure for the operation of an anti-g system?

1. The emergency survival kit cylinder
2. The air-conditioning ducting
3. The engine compressor bleed-air ducting
4. Either 2 or 3 above, depending on type of aircraft

1-11. How many types of anti-g valves are used in naval aircraft?

1. One
2. Two
3. Three
4. Four

1-12. What is the maximum pressure provided to the anti-g suit?

1. 1.5 psi
2. 5.0 psi
3. 10.0 psi
4. 11.0 psi

1-13. What are the positions of the demand and exhaust valves after the g-farces applied to an aircraft, have stabilized and become constant?

1. Demand valve closed, exhaust valve open
2. Demand valve closed, exhaust valve closed
3. Demand valve open, exhaust valve open
4. Demand valve open exhaust valve closed

1-14. In what location in an anti-g system is the filter unit installed?

1. In the outlet port of the anti-g valve
2. In the supply line to the anti-g valve
3. In the inlet port of the anti-g valve
4. Either 2 or 3 above depending on the type of aircraft

1-15. A composite quick disconnect may include which of the following service lines?

1. Oxygen and ventilating air
2. Anti-g system and communications
3. Both 1 and 2 above
4. Defog and anti-icing system

1-16. What prevents foreign material from entering the anti-g system quick-disconnect hose when it is not in use?

1. A ball check valve
2. A spring-loaded cover
3. It is stored in an inverted position
4. A plastic cap

1-17. If the required test equipment is available, dual range anti-g valves may be repaired by AIMDs. Repair of single stage anti-g valves is not recommend.

1. True
2. False

1-18. Which of the following actions should you take after removing and replacing an anti-g filter?

1. Make a logbook entry
2. Check for free piston movement
3. Test the relief valve
4. Check for air leaks

1-19. In what range should an operational check be performed on dual range anti-g valves?

1. High range
2. Low range
3. Both 1 and 2 above

1-20. The vent-air system provides a measure of personal comfort by offsetting discomfort caused by which of the following circumstances?

1. Wearing the antiexposure suit
2. Heat created by cockpit equipment
3. High-temperature ambient air
4. All the above

1.21 Temperature control of the vent-air system is regulated between which of the following ranges?

1. 40°F and 80°F
2. 50°F and 100°F
3. 70°F ± 15° F

1-22. The vent air controller responds to signals from which of the following devices?

1. The vent suit temperature control valve
2. The temperature sensor
3. The temperature selector
4. Both 2 and 3 above

1-23. The range of numbers on the temperature selector thumbwheel is 1-14.

1. True
2. False

1-24. When an aircraft is changing altitude, the temperature is maintained within what tolerance level?

1. A ± 2°F
2. A ± 5°F
3. A ± 10°F
4. A ± 12°

1-25. Which of the following valves protects the vent-air system from accidental compressurizatiom?

1. Check
2. Bypass
3. Restrictor
4. Relief

1-26. Which of the following conditions could occur from the formation of ice on aircraft surface?

1. Decreased lift
2. Additional weight
3. Difficulty in controlling aircraft
4. Each of the above

1-27. How many methods are used on naval aircraft to eliminate or prevent ice formation?

1. One
2. Two
3. Three
4. Four

1-28. Which of the following groups of deicer boots starts to inflate after 30 seconds of an inflation cycle have elapsed?

1. Inbaard wing
2. Outboard wing
3. Outboard stabilizer and vertical fin
4. Inboard stabilizer and fin

IN ITEMS 1-29 THROUGH 1-32, SELECT FROM COLUMN B THE DEICING SYSTEM COMPONENT THAT PERFORMS EACH FUNCTION IN COLUMN A. COMPONENTS IN COLUMN B MAY BE USED MORE THAN ONCE.

	A. Functions	B. Components
1-29.	Allows suction to be applied to the deicer boots to hold them down during flight	1. Pressure regulator and relief valve
1-30.	Causes the inlet to the boots to change from suction to pressure when energized	2. Distributor valve 3. Ejector 4. Suction relief valve
1-31.	Maintains the pressure of the bleed air in the deicer system at approximately 18 psi	
1-32.	Provides the necessary suction to deflate the deicer boots	

1-33. When suction in the manifold lines becomes excessive, the suction relief valve will open and stay open until suction pressure is reduced to approximately what pressure?

1. 5 in Hg
2. 2 in Hg
3. 6 in Hg
4. 4 in Hh

1-34. What indicates normal system operation of the deicer system?

1. Steady gauge readings of 18 psi and 6 in Hg, respectively
2. A slight fluctuation of the pointers on the gauges
3. Steady gauge readings of 1.0 psi and 2 in Hg, respectively
4. A fluctuation of 10 to 20 psi of the pointers on the gauges

1-35. Maintenance of the deice boot system is normally preformed by what ratings?

1. AE
2. AME
3. AMS
4. Each of the above

1-36. Which of the following surfaces is not protected by the deice and anti-icing system for the S-3 aircraft?

1. Vertical stabilizer leading edge
2. Engine nacelle
3. Ram air inlet
4. Parts of the engine

1-37. What is the purpose for sequencing the bleed–air deicing and anti–icing systems?

1. To control temperature
2. To control pressure
3. To minimize bleed air consumption
4. To prevent air duct overheat

1-38. After being used, what happens to anti–icing air?

1. It is returned to the system to be reheated
2. It is vented overboard
3. It is routed to the cabin air system
4. It is returned to the engine

1-39. To ensure the flow of bleed air is directed to the appropriate points regardless of the position of movable surfaces, which of the following components are used?

1. Extension ducts
2. Leakproof rotary joints
3. Both 1 and 2 above
4. Special wing fold seals

1-40. Which of the following areas should follow the right center wing in proper sequencing of the anti-icing system?

1. Left inboard wing
2. Left center wing
3. Right outboard wing
4. Right horizontal stabilizer

1-41. The cyclic valve will remain in the open position for 30 seconds or until the aircraft skin temperature reaches what maximum level?

1. 35° ± 2°F
2. 50° ± 4°F
3. 60° ± 3°F
4. 100° ± 5°F

1-42. The DEICE-HOT indicator light will come on if aircraft skin temperature exceeds what maximum level?

1. 75° ± 3°F
2. 100° ± 4°F
3. 200° ± 5°F
4. 300° ± 10°F

1–43. Normal deicing is available in which of the following circumstances?

1. Both engines operating
2. Single engine operation
3. Both 1 and 2 above
4. Engine-start cycle

1-44. The deicing system cannot be operated until the anti-ice switch is set to which of the following positions?

1. Deice Hot
2. Wing – Emp
3. Eng - pitot
4. Reset

IN ITEMS 1-43 THROUGH 1-49, SELECT FROM COLUMN A THE FUNCTION PERFORMED BY THE UNIT LISTED IN COLUMN B. UNITS IN COLUMN B MAY BE USED MORE THAN ONCE.

	A. Functions	B. Units
1-45.	Regulates deicing air pressure when energized	1. Deice pressure regulator Valve
1-46.	Maintains a constant reference pressure when the deice system is operating	2. Wing and empennage deice timing controller
1-47.	Interrupts the operating sequence if the leading edge skin temperature exceeds 60° ± 3°F	3. Control air pressure regulator
1-48.	Shuts off deicing air when de-energized	4. Probe sensor tempera-ture transmit-ter
1-49.	Provides 30-second sequential control signals to each cyclic valve	

1-50. When the deice pressure regulator is activated, spring pressure is overcome by control air pres-surizing which of the following chambers?

1. Chamber A
2. Chamber B
3. Both 1 and 2 above
4. Chamber C

1-51. When the solenoid valve mounted on the cyclic valve is de-energized, it performs which of the following functions?

1. Vents chamber A air to ambient
2. Vents inlet air to ambient
3. Vents downstream air to ambient
4. Vents inlet air to chamber A

1-52. When a deicing thermostatic switch senses an overheating conditions, it causes which, if any, of the following actions to take place?

1. Deice warning light comes on
2. Deice system shuts down
3. Cold air is added to lower the deice air temp
4. None

1–53. Malfunction of the S-3 aircraft engine anti-icing system primary pressure regulating element is indicated by what system response?

1. A light on the control panel comes on
2. The system automatically shuts clown
3. Extension of a pop-out button on the Valve
4. The formation of ice

1-54. In the event of electrical power failure, the engine anti-icing valve will take what position?

1. Remains in the open position, if open
2. Moves to the “anti-icing ON” position, if closed
3. Either 1 or 2 above depending on positiom of the valve
4. Moves to the closed position, if open

1-55. The sensing element of the S-3 bleed-air leak detection system will respond to which of the following conditions?

1. Pressure loss
2. Heat
3. Airflow
4. Each of the above

1-56. The test circuit of the bleed-air leak detection system is powered by what voltage level?

1. 400Hz, 115 Vdc
2. 28 Vdc
3. 60 Hz, 115 Vdc
4. 115 Vdc only

1-57. In normal operation, the chemical in the bleed-air leak detectian element conducts electrical current to activate the indicator light when temperature exceeds what maximum level?

1. 100°F
2. 225°F
3. 255°F
4. 375°F

1-50. The bleed air leak detector control contains what number of modules and electrical circuits?

1. 1 module with 2 electrical circuits
2. 2 modules with 4 electrical circuits
3. 1 electrical circuit with 2 modules
4. 2 electrical circuits with 4 modules

1-59. The S-3 aircraft air for internal stores heating is provided by what source?

1. Crew compartment exhaust air
2. Eked-air deicing and anti-icing supply
3. Windshield defog supply
4. Engine 14th stage bleed-air

1-60. Cooling air for the F–18 aircraft radar liquid cooling system heat exchanger comes from which of the following sources?

1. Ram air
2. Air cycle air conditioning system
3. A cooling fan
4. Each of the above

1-61. Radar liquid coolant fluid for the transmitter is maintained within which of the following temperature ranges?

1. 40°F to 55°F
2. 60°F to 75°F
3. 80°F to 90°F
4. 100°F to 110°F

1-62. An electrical ground is provided to the closed side of the liquid cooling ram air valve through which of the following components?

1. Weight on wheels relay
2. Air data cumputer, when ram air is hot
3. Either 1 or 2 above
4. Low fluid level switch

1-62. Excessive contaminatian of the radar liquid cooling system filter will cause which of the following actions?

1. Bypass valve to open
2. Extension of a manual reset indicator
3. Ram air valve to go fully open
4. System to automatically shutdown

1-64. Contamination of the F-18 aircraft waveguide pressuri-zation filter will cause which of the following actions?

1. A relief valve to open and bypass air around the filter
2. Extension of a manual reset indicator
3. Ram air valve to go fully open
4. System to automaticdlly shutdown

1–65. Waveguide cavities are pressurized to what maximum pressure?

1. 14 psi
2. 14 psi
3. 19 psi
4. 19 psi

1–66. The waveguide pressurization system contains what number of ground test ports?

1. Zero
2. Two
3. Three
4. Four